



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Sanjit Datta	Project Number S0806
Project Title Using Nitrifying Bacteria to Reduce Levels of Nitrogen Compounds in Madrona Marsh	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Madrona Marsh, a vernal marsh in Torrance, California, has occasionally altered water quality in which there are raised levels of several nitrogen compounds. A possible solution to this challenge is the use of Nitrobacter and Nitrosomonas, two genera of nitrifying bacteria that are commercially available. The objective of this project is to test these bacteria and determine whether they would lower the level of nitrogen compounds in the Madrona Marsh Sump during periods of altered water quality.</p> <p>Methods/Materials The experiment was done by first collecting twenty gallons of Sump Water at the Marsh. This water was then divided into two tanks, one for the Experimental Group and the second for the Control Group. The water in each tank was tested each week for ammonia, nitrate, and nitrite concentration. Commercially purchased Nitrobacter and Nitrosomonas were added to the water after the water had been allowed to stabilize in the lab for one week. At the end of that week, the water was tested twice more. Another set of water samples was then collected from the same place in the Sump, in order to establish statistically reliable data. Exactly the same experimental procedure was followed for the second set as for the first.</p> <p>Results The bacteria were found to do an effective job of reducing the levels of ammonia, nitrate, and nitrite in the Madrona Marsh Sump water. Many of the levels in the Experimental Group stabilized with concentrations recorded in the Control Group - but in certain cases, the added bacteria reduced the amount of the nitrogen compounds much faster than they decreased naturally.</p> <p>Conclusions/Discussion The results show that the bacteria could be used to quickly reduce the concentrations of these compounds, and thus help to remediate one aspect of the water quality challenge at Madrona Marsh, when necessary. The results suggest that the concentrations would naturally be lowered (by bacteria already in the water), but reduction by the artificial addition of Nitrobacter and Nitrosomonas would quicken this process and allow the Manager/Naturalist at Madrona Marsh to reduce the amount of nitrogen compounds in the Sump water of Madrona Marsh. The addition of naturally occurring bacteria to accelerate these processes may undergo further research and possibly become a widespread technique of quickly lowering levels of ammonia, nitrate, nitrite, and other inorganic nitrogen compounds in freshwater bodies.</p>	
Summary Statement I used nitrifying bacteria to reduce concentrations of ammonia and solve water quality problems in Madrona Marsh.	
Help Received Father and siter helped create board; Mr. Carr helped design and execute project; Mother provided transportation to research site.	